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SCIENCE NEWS LETTER

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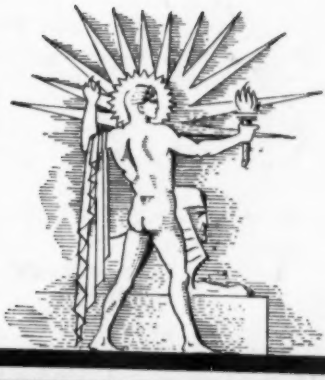

June 7, 1941

Modern Betsy Ross

See Page 359

A SCIENCE SERVICE PUBLICATION

Do You Know?

Only about 22% of the United States population receives *dental care.*

Gibraltar has been an island since 1940, when the British completed a canal back of it as additional defense.

Velvet made of nylon—not yet commercially produced—is said to resist crushing and wrinkling.

Shoshone Indians of Nevada had dice games popular with men and other dice games that women played.

The *Army Medical Library* in Washington has about 1,000,000 books, magazines and other reference items.

Some Eskimos believe that *killer whales* are really wolves that take this form when they jump into the sea.

In the Field Museum's *Egyptian* collection are mummies of a goose, two vultures, hawks, cats, a gazelle, an ape, and what may be a lizard.

The Chinese take it for granted that the *Burma Road* will have such frequent washouts in mountain passes in rainy months that working squads must be on duty along the way.

World War *camouflage* was designed chiefly to distort vision so that the enemy would not get the range of ships, whereas now camouflage aims to conceal objectives and to produce dummy objectives that will delude the enemy into wasting ammunition.

Aluminum for one bomber would make 60,000 coffee percolators.

The "electric eye" can be used to measure the *protein* in wheat, government grain specialists find.

A cache of 700 *jade* axes, pendants, ear plugs and other objects of jade was recently unearthed in southeastern Mexico.

In Napoleon's time, one man making *supplies* was sufficient for each two soldiers; today it takes 18 men in industry to maintain one soldier.

In 1830 there were just 23 miles of *railway track* in the United States.

Hummingbirds do not live entirely on nectar—they consume quantities of insects.

Since the Social Security Act became a law in 1935, 1,577 counties have full-time *health departments,* compared with 762 before.

The first printed *road map* was published in Nüremberg, at the end of the fifteenth century, for the guidance of pilgrims on their way to Rome.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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SCIENCE NEWS LETTER

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BIOLOGY

Start of Human Life Shown by Electron Microscope Pictures

Problems of Human Sterility May Also Be Solved With Aid of Pictures Magnifying Spermatozoa 27,000 Times

NEW and detailed knowledge of how human life is started when the sperm cell penetrates the egg cell is expected from electron microscope pictures of human spermatozoa which reveal for the first time many hitherto unknown anatomical details of the human male parent cell.

Facts already learned from preliminary study of the picture of a spermatozoon from a 32-year-old father of four children are reported by Dr. Frances I. Seymour and Dr. Moses Benmosche, of New York (*Journal, American Medical Association,* May 31).

Problems of human sterility may also be solved with the aid of these pictures which magnify the spermatozoa 27,000 times.

The spermatozoon, as revealed by these pictures, has a head; a body, formerly considered its neck, nearly twice as long as the head is wide at its widest part; and a tail more than nine times as long as the body. This is much longer than previously supposed, and the tail is now seen to contain variations in structure which may enable it to perform some special function.

The head is pear-shaped with a crater-like notch at its crown. This newly discovered feature "may very well be some form of suction apparatus to facilitate the penetration of the ovum (egg)," the scientists report.

The body, which used to be called the neck, "appears to be a segmented structure, averaging nine to 12 segments in the specimens examined. . . . Throughout the length of the body runs a core which is approximately uniform in diameter. This core is distinguished from the rest of the body by its opacity, being denser than the segmented structure around it. The core becomes the tail.

"The apparent segmentation of the body probably accounts for the extraordinary motility of the head of the spermatozoon as it is propelled in a forward movement."

Previous knowledge of spermatozoa consisted of three points: motility or non-motility; the general appearance when magnified 2,000 times, instead of the present 27,000 times; and the number in a given specimen. Fertility was supposed to depend either on ability of the spermatozoa to move, or on an imaginary spirem arrangement in their mid-section. This last theory was not confirmed by the electron microscope pictures.

"As research in these higher magnifications goes on," the scientists declare, "we may have to throw overboard the old theories of chemotaxis (chemical attraction of the egg for the spermatozoon) and revamp much of what was heretofore believed true."

Science News Letter, June 7, 1941

VERY STRANGE BIRD

These infant brown pelicans were photographed in their birthday suits by the U. S. Fish and Wildlife Service. It is lucky, they suggest, that these birds do not go farther north than the Cape Romain Refuge in South Carolina.

PSYCHOLOGY

Germany's Psychological Warfare Plans Revealed

GERMANY began arming for the present World War, long before she started building airplanes and tanks, by building up systematic plans for psychological warfare.

These plans are revealed in a comprehensive survey and bibliography of German books and articles on war psychology now being completed for the Committee for National Morale under the direction of Ladislas Farago. Much of the material studied exists in this country only in microfilm copies and is available only to this Committee.

One section of the survey deals with psychology in total war. Here are included German psychological writings dealing with weapons of psychological warfare, propaganda, terror, intimidation, the fifth column, strategy and tactics, fields of psychological warfare, national psychology, and psychological espionage.

Problems of the selection and testing of military personnel, which has received emphasis in American military

psychology, is only a small and unimportant part of German psychological warfare, this survey indicates.

The psychology of combat has received the attention of German psychologists. They discuss fatigue in combat, panic, and anxiety, and how to control these conditions.

Problems of leadership and the psychology of military life also have sections of this survey devoted to them.

An English translation of all 600 articles and books has been prepared. A brief biography of each author and his present status in Germany is included if available. And abstracts of 200 books and articles of greatest significance for American problems have been prepared.

Cooperating with Mr. Farago in the preparation of this survey are Prof. Gordon W. Allport, Prof. E. G. Boring, Dr. S. S. Stevens, and Dr. J. G. Beebe-Center, all of Harvard University; Prof. Kimball Young of Queens College and Dr. Floyd Ruch of the University of Southern California.

Science News Letter, June 7, 1941

PSYCHOLOGY

Hint That Color Blindness Can Be Remedied By Vitamin A

Experiment With Eight Color-Blind Students Indicates Errors Can Be Reduced After Only 12-Day Treatment

FIRST hint of a possible "cure" or at least partial cure of color blindness, hereditary defect for which scientists have hitherto always believed nothing could be done, now comes from experiments with vitamin A treatment reported by Dr. Robert D. Loken, of the psychology department of the University of California at Los Angeles.

A group of eight color-blind college students made only half as many errors, on the average, in seeing colors after 12 days of vitamin A treatment as they did before treatment, Dr. Loken discovered.

"Before vitamin A dosage the total score for the eight subjects was 88, or an average of 11 errors," Dr. Loken reports. "After the dosage the score was 34 for the entire group, a reduction of six errors per person."

Vitamin A is the vitamin needed to prevent night blindness. This is apparently the first report of its use in treating color blindness. In the California experiments each student took 12 capsules containing 25,000 units of vitamin A, one capsule each day. This is more than four times the amount recommended as the daily requirement of an adequate diet.

Vitamin A cannot yet be considered a cure for color blindness. Dr. Loken pointed out that his is only a preliminary experiment and that many other factors must be investigated.

"There is no implication," he declared, "that all or any cases now unfit for industrial purposes because of color-vision deficiency might benefit sufficiently from vitamin dosage to bring them up to the 'normal' level of color discrimination."

The color blindness of the college students given the vitamin A treatment ranged from a slight red-green confusion to large error scores over a wide range of color when tested by a revised form of the Nela test of color vision. Some made as many as 21 errors out of a possible 24.

Science News Letter, June 7, 1941

WILDLIFE

Beavers Make Reservoirs For Livestock in West

BEAVERS building dams in upper watersheds of a soil conservation district in Utah are welcomed by stockmen, because they provide places where cattle can be watered, without human labor or expense. The same beavers were berated as pests a few months ago, when they were living farther down, in irrigated country, and playing hob with the irrigation canals. Wildlife management workers trapped them out, moved them to the uplands, and released them on streams where their labors would be beneficial instead of trouble-making.

Science News Letter, June 7, 1941

TALKING WITH LIGHT

Sidney Cooper, 17-year-old Stuyvesant High School student, talks into the microphone. His voice modulates light beam of flashlight held by Jordan Prince, 15, of College of City of New York. The photoelectric cell at right transforms beam into sound heard by Walter Kublin, 16, also student at City College. The three boys are members of the Experimental Electronics Society and are demonstrating their work at a joint meeting of the American Institute Science and Engineering Clubs and the New York Electrical Society.

GIRL SCIENTIST

Mary Briscoe, 15-year-old Chem Squad member from Girls' Commercial High School, Brooklyn, N. Y., demonstrates the use of sulfamic acid on cloth at right for fireproofing. She took part in demonstrations by boys and girls at a joint meeting of the American Institute Science and Engineering Clubs and New York Electrical Society on May 28.

AGRICULTURE

Enormous Surplus of Wheat Powerful Aid After Conflict

Unprecedented Accumulation of 400 Million Bushels Will Be Augmented by About 850 Million This Year

MOUNTAINS of wheat, bushels in absolutely astronomic number, are heaped up in America's grain elevators and storage bins, as another huge new harvest awaits the reapers, with heads already well filled at the southwestern end of the Wheat Belt. This unprecedented accumulation of basic foodstuff is one of the country's severest economic problems, and in any but an abnormal time would be an unmitigated headache.

As it is, however, there are some redeeming features about this glut of grain, so huge that all the mouths in the country could not eat it up in less than three years, even if not another bushel were added. At least, that is how Vice President Wallace, who as Secretary of Agriculture struggled for eight years with the problem, feels about it. He has this to say:

"In times like these, it gives us a comfortable feeling to know that the new wheat crop, plus the carry-over, will provide us with the largest supplies in history. While we also have a very large carry-over of corn, there is always a possibility that unusually dry weather in July and August may damage the growing crop, and in case of need surplus wheat can be substituted for corn in the animal diet. The proteins of the two grains supplement each other."

The potential economic headache in the wheat surplus lies in the fact that without Government support this enormous mass of grain would force prices down to levels ruinous to farmers. The new bill just enacted by Congress and signed by the President, which supports the price by loans on wheat produced under AAA contract terms to the extent of 85% of "parity," is intended to keep the farmer's purchasing power abreast of the city man's.

Criticism has been leveled at this advance in the Government loan rate on wheat, and even some of the staunchest supporters of the AAA system have had twinges of doubt whether the increase should have been as great. Advocates of the new act, however, declare that the expected rise, from around $1 to about $1.14 a bushel, can legitimately be held responsible for a cost increase of less than a quarter of a cent per pound loaf of bread. If the price of bread goes up more than that, they claim, the rest of the boost must be looked for elsewhere —in the pay envelopes of labor, or in the profits of the processor, or in that vague category styled "general overhead."

However, regardless of controversy over the price of wheat, the quantities of wheat now in sight are simply overwhelming. The carry-over, as of July 1 of this year, is estimated at 400 million bushels—more than twice what it was three years ago. To this will be added the crop now nodding toward harvest, which is expected to roll up to as much as 850 million bushels. Thus, on July 1 there will be in this country about one and a quarter billion bushels of wheat.

Nor is that all. Canada has a much larger carry-over than we have; it amounts to 565 million bushels. Argentina has a 160 million bushel carry-over, and Australia 73 million bushels. Add in the American carry-over and you have a total of nearly one and one-fifth billion bushels of wheat now on hand in these four major exporting countries alone.

The current crop now growing in Canada, and next season's crops being seeded in Southern Hemisphere wheatfields, are not figured in. Omitted also are the Old World wheat harvests, which because of war conditions are both unknown and uncertain quantities.

The very climate itself has conspired to increase the golden flood pouring through the grain chutes. Fall-sown wheat came through the winter in good shape, and despite drought in the East this spring has matured a good crop. All up and down the Plains region, where a few years ago drought and dust storms blasted the crop, there have been heavy snows followed by abundant rains, so that spring wheat in the Northwest and

fall wheat in the Southwest are in championship condition.

Where to put it all is one of the things that is giving gray hairs to farmers, wheat buyers, millers and Government officials. If all storage space still unused is filled up, and grain is stored in bags in old warehouses hastily made weather-tight, and wheat poured into bins vacated by some of the corn now being rapidly turned into pork and milk and eggs for our own defense workers and for shipment to Britain, it may turn the trick. But it isn't certain yet that Western farmers will not have to do what Canadian wheat growers did last year—just pile it up in enormous hills out of doors, for sheer lack of enclosed storage space. Canada, by the way, is drastically reducing wheat acreage this year by one-fourth, despite the war. Times have certainly changed since 1917!

This enormous reserve of unused wheat, which will keep in good condition for several years if properly sheltered, will stand America and the world in good stead if the war should end in a general collapse of Nazi-dominated Europe, crumbling into starvation-scourged anarchy. Then wheat-crammed ships can rush to the unblockaded ports, bringing to the peoples of the Old World the one best medicine for the malady called despair.

Food was sloganed to win the last war. This time, food can win the peace.

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AGRICULTURE

Sphagnum Moss Protects Seedlings Against Fungus

VEGETABLE and flower plants that have to be started indoors, such as tomatoes, cabbage, salvia and China aster, can be protected against damping-off, a deadly fungus disease, by planting the seed in flats filled with sphagnum moss instead of the customary garden soil. This recommendation is made by the U. S. Department of Agriculture, after long and successful experience with sphagnum as a germination medium, at the plant introduction garden at Glenn Dale, Md.

Damping-off is caused by a fungus that lurks in the soil, attacking the roots of young plants. This necessitates the extensive and expensive steam or chemical sterilization of soils that is such a burden to greenhousemen and gardeners.

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NUTRITION

Conference Declares War Against Malnutrition in U. S.

Employment of Minority Groups, No Taxes on Low Incomes, No Waste of Skimmed Milk Among Plans Urged

WAR is declared against malnutrition among the less well-off portion of the American population, low-income families as well as reliefers, in recommendations that have come out of the National Nutrition Conference for Defense.

No reduction in relief allowances under the emergency conditions is an important point. A scarcity of consumer goods that threatens to drive down the real income through price advances warrants putting unemployed to work to make more consumer goods.

Employment of Negroes and other minority groups, no taxes on incomes insufficient to provide an adequate family diet, coverage of domestic and agricultural workers under social security are among the other recommendations.

Soybean, peanut and milk products that are low in cost and nutritious would be encouraged. Milk would be made cheaper and no skim milk would be wasted. Taxes that discriminate against margarine are protested.

Technically trained producers and students would be given selective service deferment in accordance with another recommendation.

Better feeding of defense workers is another recommendation, since added meals during the work period have been found to increase efficiency, reduce accidents and decrease absences.

Need for the training of cooks and other members of food staffs in restaurants, institutions, etc., was stressed.

There will be state, county, city and local nutrition conferences and committees if several recommendations are carried out.

The suggestions and reports of the nine sections of the conference that will go to President Roosevelt as the results of the three-day conference total more than 12,000 words.

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PUBLIC HEALTH

Rehabilitation of Selectees Predicted at Conference

Men Unqualified Physically for Military Service Will Be Put Into Camps To Be Doctored and Fed

PREDICTIONS based on hints picked up at the National Nutrition Conference for Defense:

The selectees that don't make the grade physically now (and thus get out of army service) will soon be put into rehabilitation camps, perhaps under some civilian agency like NYA, CCC or some new one, to be repaired medically and fed remedially to make them fit for service.

Poor people in the cities not eligible for the food stamp plan and not on relief will be helped in some way to bring their diet up to the new food yardstick announced at the Conference.

More and more of our surplus foods, starting with skim milk which is now thrown away in large volume annually, will be dried to preserve it and reduce storage and shipping costs and facilities and thus have it available where and when needed.

These stores of dried foods will be the blue chips with which the United States sits down to the peace conference table after the war. Or, according to American ideals of humanitarianism, they will be the giant Community Chest Fund for feeding the people of the world after the present emergency.

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REGIMENTAL COLORS

A flag factory embroidery expert is at work on colors for the Eighteenth Coast Artillery. The eagle is in natural colors, the shield has a black projectile on red ground and a red octopus on yellow ground and the silk flag itself is red. Projectile symbolizes the artillery, octopus the coast. The motto means, "As much by courage as by skill."

MILITARY SCIENCE

It's Flag Day All Year In Quartermaster's Depot

U. S. Army Headquarters Depot in Philadelphia Is Working Two Shifts a Day to Make Flags for Army

See Front Cover

THE United States will be celebrating Flag Day June 14, and many cities will celebrate Flag Week, June 8 to 14. But it is Flag Day every day for 100 Betsy Rosses in the U. S. Army Headquarters Depot, in Philadelphia, who are now turning out Army flags at speed of World War days.

With a smaller flag factory plant than in 1918, it is taking two shifts a day to keep up with the present demand for flags for the Army, according to depot officers.

In normal times, the flag factory may have orders for 30 flags a day. Now, electric cutters and sewing machines whir to produce 200 storm, post, and garrison types of American flags, and 150 to 200 guidons a day. Guidons are small flags, used in guiding troops.

Post flags, flown in clear weather, look large and heavy at close range, measuring 10 by 19 feet, and made of wool bunting. But the really large flags are the garrison flags, which the Army brings out for holidays and special occasions. They measure 20 by 38 feet and each red and white bunting stripe is 20 inches wide. Made of cotton, which is cheaper than bunting, and small for standing the wind, are the Army's storm flags, only 5 by 9 feet 6.

Definite scientific standards for the United States flag have been set and recorded, so that if all Army flags, by some inconceivable mishap should be destroyed, new ones could be made with the present red and blue exactly duplicated.

To make sure that bunting and cotton for Army flags is up to requirements for fastness, the Quartermaster depot tests samples from time to time. As a rainy day test, red or blue goods is braided with some white and soaked in tap water for an hour. To test the fabric's resistance to salt water and soap, samples are soaked in tap water containing sodium chloride, magnesium chloride, and soap. Tags of color are also exposed on the depot roof to sun and air to test resistance of the Army's flag goods to fading. The life of a flag in the Army is not long, even with all scientific care in production.

In addition to quantity production of wool and cotton flags, the Army's flag factory is turning out embroidered silk flags at the rate of three or four a week. Taffeta with metallic fringe is the material for making handsome regimental flags, and for making the colors of the President of the United States and high Army officials.

Miss Mary E. Ring, in charge of the hand embroidery department, estimates that it takes just 22½ days to embroider an American eagle in shaded natural colors on one of these flags. To embroider a design completely is a 45-day job for the color-size, and 35 days for the smaller, termed a standard.

The idea of spotlighting the American flag for an entire week, introduced two years ago by the late Col. James A. Moss, as president general of the United States Flag Association, is reported to be approved by an increasing number of cities this year. As one city celebrating Flag Week, Philadelphia expects to see some of its own flag factory work flying when events of the week climax in a big parade on June 14, with Army units in the line of march, and Army flags floating down the street to Independence Square.

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● RADIO

Miss Dorothy Deming, General Director of the National Organization for Public Health Nursing, will discuss the work of that organization as guest scientist on "Adventures in Science," with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, June 12, 3:45 p.m. EDST, 2:45 EST, 1:45 CST, 12:45 MST and 11:45 a.m. PST. Listen in on your local station. Listen in each Thursday.

HISTORY

Scholar Wants to Know About "Marvelous Mule"

WHAT was the "marvelous mule" for which, in the year 1025, Bishop Leo of Vercelli, in Italy, asked Duke William V of Poitiers-Aquitaine? This is the query that Loren C. McKinney, of the University of North Carolina, proposes. (*Isis*).

It seems that in the course of a serious correspondence, the Bishop ended a letter with the request that the Duke send him "the marvelous mule for which I have been asking for six years." To this the Duke replied, in the course of a longer letter, that he could not find in his neighborhood a horned mule, nor one with three tails or five feet. However, he added, he would send him a carpet if he had not forgotten the length and width desired.

The passage is interesting from the point of view of medieval humor, says Mr. McKinney, and also, perhaps, of folklore. There are known references to asses without tails, ears, etc., but not to mules, so he asks other scholars if they can enlighten him. Of course, it might have been some private joke between the Bishop and the Duke, which even their contemporaries might not have appreciated.

Science News Letter, June 7, 1941

NUTRITION

All Staple Foods May Be Brought Into Defense Line

AT the close of the National Nutrition Conference for Defense which President Roosevelt called for May 26, 27 and 28, the signs point to a revamping of many staple foods to bring them into what might be called the vitamin defense line.

Food will not be food, it appears, unless it is supervitamined.

First step in this direction was taken when bakers, millers and nutrition authorities collaborated to make available enriched bread and flour so that the staff of life would contain extra amounts of morale vitamin B1, pellagra-preventing nicotinic acid, and a third important B vitamin called riboflavin.

Many nutritionists and doctors gathered for the conference think this is only one step of many that must be taken to make sure that all people in the United States will be able to get the vitamins and other essential nutrients they need to build health, strength and courage for national defense and for the difficult tasks that lie ahead.

Sugar and fats are next on the list for vitamin enrichment. Sugar, fats and plain white flour have for years been making up two-thirds of the calories in the diet of large numbers of people. It is almost hopeless to try to get the vitamins and minerals needed for health from the remaining one-third of food calories. Even if all the flour or bread taken is in the form of enriched bread and flour, it will not supply all the needed vitamins and minerals. It is only being enriched, with some exceptions, with certain of the B vitamins and iron.

This leaves vitamins A, D and C, and the minerals, calcium and phosphorus, to be supplied by other articles of daily diet. The place to put vitamins A and D, it is urged, is in fats. Butter is a good source of vitamin A but many cannot afford butter. Some margarines have vitamin A added, but nutrition authorities claim that all margarines and also lard and other edible fats should have vitamins A and D added. Vitamin D is the well-known anti-rickets vitamin. Vitamin A is needed for growth and general health and, important in defense planning, to prevent night blindness. If black-outs become a feature of our defense, we need particularly to be protected against night blindness.

Large supplies of bone and tooth building calcium and phosphorus as well as proteins are fed to the pigs or thrown away altogether each year in skim milk. Americans do not like to drink skim milk and they are not cheese eaters to any extent, but they do like sugar. So it has been suggested that sugar be enriched with dried milk solids, which would provide extra amounts of minerals and of proteins. Technical difficulties exist because the crystals of ordinary granulated sugar would not mix smoothly with powdered milk. A number of suggestions have, however, been made for overcoming this difficulty.

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AGRICULTURE

Planting Treated Sticks Feeds Vitamin to Plants

VITAMIN B-1 is conveniently supplied to plants by sticks of green wood, impregnated with the vitamin. These are thrust into the soil close to the roots. Every time the plant is watered, the vitamin is released.

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IN SCIENC

RESOURCES

Chromite Deposits of Alaska May Be Worked

CHROMITE, source of chromium needed in highgrade steels and for plating metals, may be mined on the Kenai peninsula in Alaska, to replace imports from Turkey if the latter are cut off by Nazi conquest. Presence of the chromite deposits in the northern territory has been known for 30 years, and one of the ore bodies was worked in a small way during the first World War, but it was not until the summer of 1940 that a systematic survey of all deposits in sight was made by the U. S. Geological Survey.

A preliminary report on the Kenai chromite bodies has just been made by the Department of the Interior. Estimates of the quantities in sight total 150,000 tons. Of this about 70,000 tons is of shipping grade. The remainder is low-grade ore, requiring concentration on the spot before shipping would be economically practicable. There is good deep-water anchorage for ships, but short roads would have to be built over rugged country.

Last year's chromite requirements in this country were 660,000 tons, of which less than one per cent was produced within the continental United States. Turkey's share of our imports was 70,000 tons. Other overseas sources of chromite imports are Africa, Cuba, British India, New Caledonia and the Philippine Islands. Greece and the USSR used to be in the picture in a minor way, but they are of course sending us nothing now.

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INVENTION

Headlighted Screwdriver Has Battery in Handle

A SCREWDRIVER with a headlight was patented the other day. In the handle is a one-cell battery, and a lamp, which is aimed toward the business end. The shank is curved, so that the point is in line with the light. (*John V. White, Niles, Ohio.*)

Science News Letter, June 7, 1941

NCE FIELDS

MEDICINE

Pneumonia Drug Found Effective in Malaria

A DRUG originally developed as a pneumonia remedy may become a successor to quinine for treatment of malaria, it appears from use of the drug in bird malaria reported by Dr. Robert Hegner, Evaline West, Mary Ray and Marian Dobler of the Johns Hopkins School of Hygiene.

The drug is a quinine derivative with the long name of hydroxyethylapocupreine dihydrochloride. Dr. W. W. G. Maclachlan and co-workers in Pittsburgh used with good results in treatment of pneumonia.

The effects of the drug are similar to those of quinine hydrochloride in treating malaria in ducks, pigeons and canaries, Dr. Hegner and associates report to the *American Journal of Hygiene*. The new drug has the advantage of being less toxic than quinine hydrochloride. Consequently larger doses can be given without harm to the malaria sufferer.

"Since malaria parasites in birds have been found to react to drugs similarly to those in man, it seems probable," Dr. Hegner suggests, "that hydroxyethylapocupreine dihydrochloride will be as effective against human malaria as it is against bird malaria."

Science News Letter, June 7, 1941

LANGUAGE

Spanish Schoolbooks For Young Indians

A NEW tool to build friendship between the United States and Latin America is at hand—and all because Papago Indians of the Southwest asked Uncle Sam for schoolbooks translated into three languages, including Spanish.

Possibility that Indian schoolbooks, now being translated and printed in bilingual English-Spanish version, will offer a lively and attractive introduction for white children to the Spanish language is seen by Dr. Willard W. Beatty, U. S. Office of Indian Affairs director of education. First of the new books comes off the press in June.

Dr. Beatty holds the educational theory that a "pony" need not hide in the back of a language book to be consulted only when teacher is not looking. In some of the Indian Office's newest schoolbooks for young Indians, English and Indian language text march side by side down the page. The same educational approach will be used in primers and readers turned out in English-Spanish form for Southwestern tribes that want them.

"If you put a dozen of these books into a school for white children in New Mexico," said Dr. Beatty in an interview, "the children would begin to use Spanish words and interest in Spanish would grow."

The Office of Indian Affairs, he stated, is taking as much trouble to obtain Spanish translation for Indian pupils as it takes in making school books written in Indian languages correctly Indian in literary style.

First Spanish lesson book will be for Pueblo children, a story of New Mexican mountain country by Ann Nolan Clark, entitled "Young Hunter of Picuris."

The Spanish book Papago parents asked for is now being translated. Young Papagos will learn Spanish by reading "Desert People," which Dr. Ruth Underhill, ethnologist of the Indian Office staff, wrote originally in English to give the tribe its first history book of its own past.

Also new in Indian education is a series of study books to teach Indian children about their own tribes. For Papago pupils, Dr. Underhill has produced one of the first of these books, to teach the children what the social customs and handicrafts of their forefathers were like, in the Arizona desert where they live.

Paradoxical as it seems, young Indians today have to get such information from white men and women—scientific experts. Tribes differ in the amount of instruction about tribal culture that they give to their young people, Dr. Underhill emphasizes. But older Indians who recall the facts accurately are dying off.

When young Indians take interest in learning basketry or other arts, there is danger that the children will copy poor designs—or even modern advertisements—in their efforts to produce Indian work. To give them the finest art standards, from the "old-masters" of their tribe, is just one of the goals of the Indian schoolbooks that tell Indians about Indians.

Science News Letter, June 7, 1941

ARCHITECTURE

Vanishing Altar a Feature Of Army's New Chapel

A VANISHING altar, which slides silently into the church wall like a secret panel, is a new feature of the 555 chapels that the Quartermaster Corps has started to build in the nation's Army camps.

The movable altar is the Army's own invention.

The new chapels, all to be constructed alike, are so planned that they can be converted quickly into church or synagogue, explained Chaplain Arhey Lev of the office of the Chief of Chaplains, U. S. Army.

For Jewish services and some Protestant church services, the paneled-front altar retires invisibly into the paneled wood wall. Above the altar, wall paneling has an additional invisible compartment, which can be opened at Jewish services to form an Ark holding the Torah, or holy scroll, of Jewish faith. For Catholic services, and Protestant services when wanted, the altar is moved forward.

No religious symbols will be built into the Army's new chapels, Chaplain Lev stated. The chapel will stand out on the post landscape, marked chiefly by a steeple on its gabled roof, steeples having been associated from early times with man's efforts to reach up to heaven. The Office of Chaplains hopes to equip each chapel with a set of ecclesiastical ware, including a cross, crucifix, pair of candlesticks and pair of vases.

The chapels, which will replace improvised buildings of many types, are to be completed in three to six months from the start of work at the first chapel at Arlington Cantonment, where Sunday ground-breaking ceremonies were held May 4.

Science News Letter, June 7, 1941

FORESTRY

Forest Fires in April Destroyed 1,300,000 Acres

FOREST fires during the month of April swept over more than 1,300,000 acres of timber land, principally in the South and East, figures compiled by the National Wildlife Federation indicate. Translated into terms of lumber, the destruction comes close to 300 million board feet, or enough to build barracks for nearly 200,000 soldiers.

Science News Letter, June 7, 1941

NUTRITION

Even Poor Rural Communities Can Have Adequate Diet

Experiment in "Applied Economics" Shows Nutrition Level Can Be Improved Without Any Help From Outside

"THERE is no rural community in the United States so poor that it cannot have an adequate diet," Dr. Harold Clark of Columbia University told the Food Habits Committee of the National Research Council.

In an experiment in "applied economics," carried on under a grant from the Sloan Foundation, the poorest communities that could be located in the United States were selected. An attempt was made to improve the nutrition of the people entirely without the expenditure of any money from outside the community itself.

Health tests already indicate an improvement in the health of the people, reflecting a higher nutritional level, after only five years of the program, Dr. Clark said. This is much more rapid than was anticipated when the experiment started. At first it was not hoped that much could be accomplished within the span of a generation.

Ordinary books on agriculture fail to reach adequately the lowest third of the agricultural population, Dr. Clark told the Committee. In the Southern Appalachian community described by Dr. Clark, where the typical family income is only $35 a year, textbooks and even demonstrations are often beyond the understanding of the people, he said.

Yet when children in the public schools were given readers describing in easy words how to keep pests out of the garden or how to store vegetables in the winter, parents demanded that the books be brought home for reading.

Some of these children had actually never in their lives seen milk, Dr. Clark said. But after they had been given a school reader telling how to keep a goat, two goats, almost miraculously, appeared in the community.

That school lunches are profitable to a community was indicated by a report to the Food Habits Committee by Dr. I. H. Moore, of the Georgia Department of Public Health.

Hot school lunches are an important part of the child health demonstration program in Hancock County, Ga. This program has reduced by 40% the number of children who are "kept back" and have to repeat a grade. These repeaters, it is estimated, cost the community as much as $35 apiece to provide the additional schooling.

Records of eating habits of 100 expectant mothers seen at clinics this year compared with 100 in 1938 indicate that the instruction given in the community during that time has increased consumption of milk, eggs and fresh vegetables. The people still eat fat-back to the exclusion of lean meat, however. No change has been observed in meat eating habits despite instruction, Dr. Moore said.

Science News Letter, June 7, 1941

CONQUERORS OF YELLOW FEVER

The artist, Dean Cornwell, is showing his completed painting to Col. C. M. Walson, Second Corps Area Surgeon, pointing out Dr. Carlos Finlay (in black coat) who with Major Walter Reed (hand on hip) conquered yellow fever and made possible the Panama Canal, vital link in America's defense now. This third painting in the series "Pioneers of American Medicine," was unveiled on June 2 by Miss Blossom Reed, daughter of Major Reed.

ANATOMY

Sex Hormones Shape Bones; Account for Sex Differences

EVIDENCE that sex hormones play important roles in the shaping of the long bones of the skeleton is offered by Dr. J. L. Bremer of Harvard University Medical School. The female sex hormone, theelin, has a softening effect, permitting certain wandering cells in the blood to dissolve and remove bone material. If theelin is present in excess, this may give rise to a serious bone-weakening disease. Normally, however, the opposite male hormones, the androgens, check this process before it becomes pathological.

All animal bodies contain a certain amount of the hormones of the opposite sex, although of course those of their own sex normally predominate. This predominance of the bone-softening female hormone in the female body may be responsible for the greater lightness and delicacy of female bones, Dr. Bremer suggested in his report to the American Association of Anatomists.

Science News Letter, June 7, 1941

GEOLOGY

Inside The Earth

Earthquake Waves Provide Primary Data From Which Scientists Infer Composition of Our Planet

THE only known abode of life in the universe is the green-garmented surface of a whirling blue ball, a speck of dust in the cosmos. This is the planet Earth. From it the brain of man looks forth into the immensities of the universe, surveys the galaxies, and weighs the stars.

But almost to the present generation one field of exploration has been closed. Man has not been able to look far under the surface of the oblate spheroid upon which his lot is cast. The interior of the earth has been a place of unsolved mysteries, and even now only a beginning has been made, almost entirely through logical deductions, toward some solutions.

Naturally the inside of the planet has intrigued man's imagination. A few generations ago he placed the abode of the damned there in a dark region of eternal fire and lakes of boiling pitch. Only 120 years ago bills actually were introduced in the Congress of the United States to authorize a Navy expedition into the interior through a supposed "hole" at the North Pole, for the purpose of appropriating for this nation rich virgin territories which an eccentric dreamer had calculated might be found there. This became an issue causing considerable political animosity at the time.

No Direct Observation

Any direct physical observations very far under the surface are, of course, impossible. Man has no way to get there. Two types of indirect observation are possible, and these have been explored so fully during the past 25 years by the Geophysical Laboratory of the Carnegie Institution of Washington and other research organizations that a fairly complete although still somewhat hypothetical picture of the planet's interior can be formed.

The primary data are furnished by earthquake waves. They move through the earth in all directions from their center of propagation, which can be precisely located. The impulses from a single shock of sufficient intensity can be detected everywhere in the world where sufficiently delicate instruments can be set up. It was observed early that the speed of these waves was not constant, that it varied for different segments of the path followed, presumably because of the varying nature of the material traversed. Through a complex mathematical procedure it was found possible to analyze these speeds and to determine the rate at which a wave was moving at the lowest point in the earth through which it passed.

Through what sort of materials would a wave travel at the observed speeds?

The determination of this basic problem was one task set for itself by the Geophysical Laboratory.

There could be set up in the laboratory experiments with matter under pressures and temperatures notably higher than those which obtain at the earth's surface —far less indeed than those at extreme depths, but tending in the same direction.

Speed Clue to Material

It had been observed, for example, that waves traveled through the uppermost ten miles of the earth's shell at a speed of approximately 3.3 miles a second. Geophysical Laboratory experiments showed that this would be precisely the speed to be expected through granite under the right pressures, and through nothing else. This same line of evidence has been extended to different levels. The work is slow and laborious, but it apparently is the most direct means of determining the internal construction of the planet upon which we live.

Geophysicists generally are agreed that the planet is wrapped in a thin crust of relatively light rocks averaging about 30 miles in thickness.

This crust is composed of several layers. First is the rough coat, about a mile thick, of loose earth, sedimentary rocks such as sandstone and limestone, and igneous rocks from volcanic eruptions. This covers a layer of granite from three to nine miles deep, the original skin of the earth.

Beneath the granite is a depth of about 25 miles of basalt. There must be enormous quantities of it, some solid, some molten into a thin liquid. The roots of a few volcanoes, notably a few in Hawaii and one in the Belgian Congo, appear to rest in this basalt liquid and occasionally pour it forth in great eruptions. Most volcanoes, however, shoot out molten granite, or rhyolite, from the more superficial layers.

There is another form of basaltic eruption which is on a far vaster scale: the so-called fissure eruption. The face of the earth splits open and the molten rock pours forth, covering thousands of square miles to depths of a mile or more. No such catastrophe has happened in the time of man. Two notable locations where something of the sort has happened in the distant past are the Columbia River basin and the Deccan area in India.

Crust Varies in Thickness

The crust varies greatly in thickness at various places. It is thickest under the Alps, very thin under the southwestern United States and most of western Europe, and of average thickness over western North America and nearly all of South America. Under large areas of the Pacific, it appears, there is none at all. This may be the result of the ancient catastrophe in which, it is believed, the moon was torn from this side of the earth.

Very slowly all over the globe the crust is increasing in thickness. It gains approximately 100,000 tons a year from the billions of invisibly minute specks of space dust which pelt upon its surface—an increase of about 5,000,000,000,000 tons, still hardly enough to be measured, in all the time of its existence.

Under this layered crust is a depth of approximately 2000 miles of an ultrabasic material of some sort, the nature of which can only be conjectured from the evidence of earthquake waves. It transmits them very rapidly, at a rate of about 4.8 miles a second as compared with 3.3 miles for granite. Whatever it is, it constitutes nearly seven-eighths of the total material of the planet. It might be said that the earth is made of it, any of the other constituents, except in the core mentioned below, being almost inconsequential in amount. Experiments at the Geophysical Laboratory show that two known forms of rock would fulfill the required conditions under the calculated pressures.

One—for various reasons the most likely—is a magnesia-iron-silica rock which is best represented by a lovely, scintillating greenish rock known as

dunite, from Dun Mountain in New Zealand, where there is an outcrop of it. It comes to the surface in a few other parts of the world in a very similar form. Some of the finest specimens have come from the Appalachians in North Carolina. It is filled with crystals of olivine, a semi-precious stone. When weathered it forms one variety of the familiar soapstone.

The second possibility, which seems quite unlikely, is that seven-eighths of the earth is made of a mineral known as eclogite, of the same chemical composition as basalt but with its crystals formed in a different way and containing the semi-precious stones garnet and jade. On the surface it is extremely rare.

It is not contended that this dunite, or eclogite if one prefers that hypothesis, is homogeneous throughout its entire depth. There are at least two discontinuities recognized by the seismologists.

All this surrounds the enormous hot heart of the planet, its core. There have been many deductions about the nature and material of this core, but there is little question at present but that it is a ball of molten iron, about 4,000 miles in diameter, having a volume about an eighth of that of the earth.

Under Enormous Pressure

It is under the enormous pressure of approximately 44,000,000 pounds a square inch, a little more than 3,000,000 times the pressure of the atmosphere at the earth's surface. Under such pressures, it is calculated, a temperature of about 10,000 degrees centigrade is necessary to melt iron.

The state of matter under such a pressure can only be conjectured, since it is more than fifteen times the greatest pressure ever obtained by laboratory methods—a little more than 2,000,000 pounds a square inch, achieved last winter at the Geophysical Laboratory. Certainly a great deal of empty space must have been squeezed out of the iron. That is, all the molecules have been pressed close together. It still, however, is far from the stage where the outer electron shells of the atoms would be crushed; for this, it is estimated, a pressure of about 100,000,000 atmospheres would be necessary.

That the core is a ball of liquid iron is a matter of fairly probable conjecture, established by Geophysical Laboratory experiments.

Must Be Heavy Metal

First, the material must be a heavy metal to account for the weight of the earth, 5.22 times that of an equal mass of water. Tests by the Carnegie Institution geophysicists have shown conclusively that the necessary weight would not be reached by any ordinary rocks under pressure. Iron is the most likely heavy metal, abundant in the sun and stars and forming a large part of the meteorites, fragments of a disrupted planet, which strike the earth.

It must be in a liquid state because of the behavior of earthquake waves which pass through the core. As soon as they strike the central core they are immediately slowed down and their character changed in the manner to be expected if they enter a "stiff liquid."

Three outstanding problems in geophysics remain to be solved. As yet hardly a beginning has been made on them.

First, the source of the earth's magnetism. The earth acts as a gigantic magnet. It has an iron center. But Geophysical Laboratory experiments show that iron loses most of its magnetic properties at temperatures and under pressures far lower than those at the core of the planet.

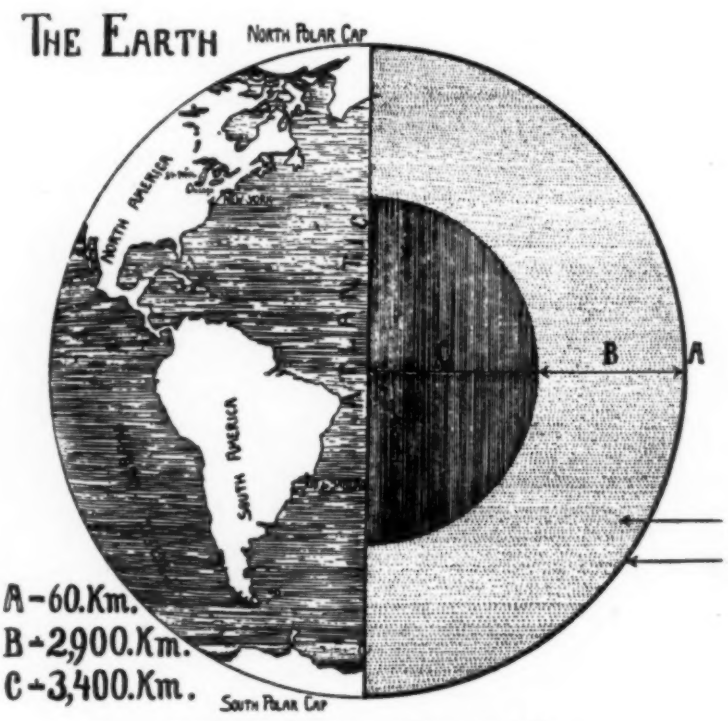
Second, the cause of deep-seated earthquakes. Those disturbances which originate in the crust can be explained easily enough as due to fractures and slippings of the relatively brittle rock. It is known, however, that some occur at depths of at least 500 miles. There is at present no simple theory of an instability at such great depths sufficient to produce such cataclysms.

Cause of Temporary Sinking

Third, the cause of the temporary depressions, apparently actual sinkings of the earth's crust, which result in shallow seas over the continents. For example, it is known that the present Appalachian mountain range has been sea bottom at least five times in the course of geologic history. This is perhaps the most difficult problem of all, and there is hardly a shred of evidence which throws any light on it.

Presumably the mountains came first, and were due—at least in part—to the wrinkling of the earth's granite "skin" because of contraction. Immediately erosion set in. Valleys were carved and summits cut down. The infinite variety of landscape was produced by this means. It continued for eons. The final result would be the leveling of the mountains almost, but never quite, to sea level. Yet they had to sink slightly below sea level for the ocean waters to rush in and cover the area. There is no known mechanism to account for this few feet of depression.

Is the process going on at present anywhere on earth? This is extremely difficult to determine, for, it may be assumed,



SECTION THROUGH THE EARTH

A is the crust, B the intermediate zone, and C the central core. (After Mohorovicic)

the sinking would be at the rate of about an inch in a thousand years. There is some slight evidence that this is happening in the Rocky Mountain area and perhaps in some other disturbed regions of the world.

This does not apply to the major ocean basins, which presumably have changed very little in shape or position since the cooling of the planet.

A difficult problem is the distribution of the radioactive elements—uranium, actinium, thorium, and radium—throughout the earth. There are extremely minute amounts of radium in the crust, particularly in the granite rocks. But if the same amounts were distributed uniformly through the planet as a whole, so much heat would have been generated that, calculations show, it would have exploded millions of years ago.

Apparently, the most recent investigations at the Geophysical Laboratory have shown, these elements, together with all but four or five of the 92 known basic building stones of creation, are confined entirely to the crust. The most rigid analysis of the dunite from North Carolina shows it to be absolutely free of radium, and it is probably representative of at least 85 per cent of the planet.

How did this happen? A plausible explanation is that the earth "froze" from the bottom up, not from the top down like a pond. First the more abundant elements entered into the simplest possible chemical combinations and crystallized. Thus was formed the dunite. Then slightly more complex crystallization resulted in the basalt, leaving for the granite, last to be formed, all the leftovers.

Another serious problem, toward the solution of which little progress has been made, is that of the observed variation in the planet's rate of rotation—that is, the length of the day. This variation, amounting to a second or more, takes place about once in a century. The late Professor E. W. Brown of Yale sought to explain it by the hypothesis that just below the basalt layer is a thin shell of some material at or near a critical temperature, so that with a very slight temperature change it increases greatly in volume and causes the crust above it to bulge outward, giving the sphere a larger radius.

The origin of the ocean basins and the continents offers a fruitful field for speculation. Some authorities have held that the land areas, covering about a fourth of the earth's surface, once formed a single mass which was shattered into six or seven major fragments, and that these have been drifting apart ever since. Another hypothesis is that the granite formed like masses of scum on the underlying semi-liquid basalt. Perhaps it was one mass in the beginning, which broke up almost at once after the cooling of the planet.

None of these problems can be completely solved except by slow, patient observation and experimentation which may well require centuries.

Science News Letter, June 7, 1941

AGRICULTURE

Growing Seed for Defense Is Very Specialized Job

Amateurs Warned Not to Experiment Unless They Have Had Experience; War Has Increased Our Demands

THE Department of Agriculture is getting letters from all over the country from eager Americans who want to help defense and make some money by growing vegetable seed.

The answer is—Don't! Not unless you already have experience, and capital besides.

Raising the seed that produce the nice red tomatoes and all the other vitamin-filled fresh vegetables for a better nourished America is a very specialized business. So government scientists emphasize. Seed growing calls for some knowledge of plant genetics. Then too, the seed business requires a good deal of hand labor, and even employed laborers need to know which types of seed-producing plants to "rogue out," as sure to produce poor stock. Spinach plants, for instance, that go to seed too rapidly are undesirables. Farmers want spinach that will produce its green harvest to full perfection.

The United States is not going so far with amateur vegetable gardening and "all out" efforts to boost the food supply as it did in the first World War, it appears at present. The Department of Agriculture is encouraging those who live on the land to grow their own gardens, and farmers are especially asked to grow more tomatoes because of British needs and for our Army's vitamin C supplies. But back-yard gardeners are not being asked to plow up their small flower beds and plant cabbage as in World War I. And while war conditions have cut off our supplies of vegetable seed from many countries, the seed problem is being tackled by experienced growers and research scientists, with success on most fronts.

Spinach, for example: The United States used to import ten times as much seed for growing spinach as it produced at home. Almost all of our spinach seed came from the Netherlands. The forecast now is that we shall produce enough spinach seed this year for our needs and there may be a surplus. We could have produced it before, but it was more economical to import.

Cauliflower seed, on the other hand, is proving harder to raise in the United States. Growers here are having to fight harder against insects and diseases, which probably do not plague Dutch seed growers so seriously.

The weather has been unfavorable for producers of beet, carrot and onion seed this spring, so that crops may be somewhat smaller than early forecasts indicated. But in general more vegetable seed of nearly all kinds is expected to be harvested in the United States this year, compared to last year. Far from being dependent on other countries, as a rule, for all kinds of seed, the United States is the world's leading producer of carrot seed. It has been "running ahead," as government statisticians put it, in production of such seed as beans, peas, carrots, and squash, and a good deal of American seed is going to other countries, notably England.

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Fido may carry *ivy poison,* explains the Department of Agriculture—brushing against the plants, a dog may get the chemical irritant on his hair, and a person who pets the dog transfers the substance to himself.

In a study of 8,000 pupils in a typical American city, about 2% of the children in kindergarten wore *eyeglasses,* and the percentage steadily increased in successive grades, showing 23.7% wearing glasses in the twelfth grade.

MEDICINE

Blood, Plasma, Rubber Armor Anti-Shock Weapons in Raids

Practical Hints for Defense-Minded Physicians Provided in Report to American Heart Association

RUBBER armor for protection of persons exposed to air raids, use of whole blood or blood plasma for shock due to air raid or similar injuries, and a new rule for first aiders on treating shock are practical hints for defense-minded physicians and laymen in the report of Dr. Alfred Blalock, Vanderbilt University, to the American Heart Association in Cleveland.

The rubber armor idea comes from British experiments, quoted Dr. Blalock.

"The explosion of a bomb," he pointed out, "may cause death even though the individual is not struck by shrapnel or debris."

In such cases, the British workers found, the most outstanding injury is hemorrhage from both lungs. The pressure wave of the blast from high explosives bruises the lungs by its impact on the body wall. This can be prevented or diminished if "the body is clothed in a suitable material which is able to take up and disperse the pressure wave."

Thick layers of rubber, the British found, protected the animals in their experiments from the blast injury.

Recent discovery that brain concussion results not from the intensity of the blow on the head but from sudden acceleration resulting from the blow may help to explain the effects of blast, Dr. Blalock suggested. If the head is kept from moving when the blow is struck, he said, the phenomenon fails to occur.

Local loss of blood and fluid, at the injured spot, are, in Dr. Blalock's opinion, the "most important and most frequently encountered of the initiating factors which result in a decline of the blood volume and in traumatic (injury) shock," although he believes other factors may cause shock in some cases.

The fluid loss theory is the most hopeful from the standpoint of treatment, and recent air raid experiences in Bristol, England, show the effectiveness of treating shock according to this theory. Dr. Blalock quoted the case report of a patient badly wounded and in desperate condition of shock who was given three pints of blood plasma and four pints of whole blood within a few hours. The wound was cleaned up and within 24 hours his general condition was "good" and blood pressure about normal.

"The single most important therapeutic procedure in the treatment of traumatic shock consists of the intravenous introduction of whole blood or plasma or serum," Dr. Blalock declared.

For the first aider, there is a warning hint not to use hot water bottles or other means to raise the temperature of the extremities of persons in shock. The hands and feet are cold at least in part, he pointed out, because some of their blood has been diverted to more vital structures, such as the brain, heart and adrenal glands. The internal temperature may not be depressed. The condition of patients in shock may become worse, Dr. Blalock warned, if intensive efforts are made to elevate the skin temperature.

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● Earth Trembles

Information collected by Science Service from seismological observatories resulted in the location by U. S. Coast and Geodetic Survey of the following preliminary epicenter:

Friday, May 16, 9:24.7 p.m., EST

In Queen Charlotte, New Hebrides region, 1500 miles west of Samoa. Latitude, 12.9 degrees south. Longitude, 166 degrees east.

For stations cooperating with Science Service, the Coast and Geodetic Survey, and the Jesuit Seismological Association in reporting earthquakes recorded on their seismographs, see SNL, Feb. 22.

MEDICINE

Discovery Links Diet With Blood Cancer

A FUNDAMENTAL discovery showing a relation between diet and cancer of the blood, or leukemia in mice and also between diet and arteriosclerosis, or hardening of the arteries, in the same laboratory animals was announced, at the meeting of the National Advisory Cancer Council, by Dr. Carl Voegtlin, director of the National Cancer Institute.

No direct evidence that cancer or leukemia in humans is due to diet has yet been obtained, Dr. Voegtlin cautioned, but he stated that the discovery "indicates that diet has a lot to do with experimental cancer."

The discovery was made by Dr. G. B. Mider and Dr. Julius White, of the National Cancer Institute. They found that when a cancer-causing chemical, methylcholanthrene, was painted on the skin of mice fed a diet rich in sulfur containing amino acids, the animals developed leukemia, the malignant and fatal disease often called cancer of the blood. When, however, the cancer-causing chemical was painted on the skins of mice fed a diet low in sulfur containing amino acids, the animals de-

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veloped hardening of the arteries, instead of leukemia.

"This is the first time," Dr. Voegtlin said, "that I ever heard of an agent producing two diseases by changing the diet."

More and more information on the relation of diet to experimental cancer in laboratory animals is coming from cancer research laboratories, he pointed out. In time, this may lead to information about the human disease. It might be that the agents which produce tumors in humans may be influenced by certain substances in the diet.

At present, however, there is no need for concern or fear that diet produces cancer in humans.

Science News Letter, June 7, 1941

MEDICINE

Blood Pressure Vaccination New Method of Attack

SCIENCE'S latest attack on high blood pressure, is a sort of vaccination, it was revealed to the Federation of American Societies for Experimental Biology.

Both reduction of high blood pressure and prevention of it in dogs has been accomplished by injections of a substance called renin from hog kidneys, Dr. George E. Wakerlin, Dr. B. Gomberg and Dr. C. A. Johnson, of the University of Illinois College of Medicine, reported.

Trial on human patients will not be made for at least another year.

The vaccination-like feature of this method of reducing and preventing experimental high blood pressure in dogs is that renin from dog kidneys does not have this effect, but on the contrary raises the blood pressure. According to one theory, the body normally has a mechanism for counteracting the blood pressure raising effect of its own renin. When this gets out of order, high blood pressure results. If this theory is correct, the hog renin reduces blood pressure in dogs by stimulating the dog's own anti-renin, somewhat as vaccinations against infectious disease stimulate production of the body's own germ-fighters.

The high blood pressure in the dogs resulted from obstructing the flow of blood through the kidneys. Hog renin not only reduced this high blood pressure, but when given before the blood to the kidneys was cut off, prevented it.

Rabbit renin will be tried next, to see whether it will have the same effect on dogs as hog renin. The renin apparently only achieves its blood pressure reducing effect when it comes from a different species of animals than that being treated.

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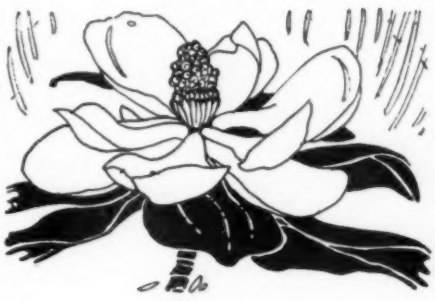
ECOLOGY

NATURE RAMBLINGS
by Frank Thone



Defiers of the Dunes

SOME trees refuse to die even when they are buried!

Many thousands of people, for many years, have seen and wondered at the half-buried trees in the sand dunes around the southern and southeastern shores of Lake Michigan—the highest dunes in the world. Some species, like oaks, give up very soon when the steady winds drift the sand deep around their trunks. Others, however, like cottonwoods and lindens, are not to be discouraged. Their branches keep on living, and throw out new roots near the new ground level established by the rising dunes. The studies of the late Prof. H. C. Cowles, of the University of Chicago, on these trees have become a classic of botany.

More recently one of Prof. Cowles' former students, Prof. Herman Kurz of Florida State College for Women at Tallahassee, has made a similar study on dunes in the South, on the Florida west coast, where the trees buried are magnolias, palmettos and other typically Southern species.

"Grain by grain the sand piles up," reports Prof. Kurz. "First the single trunk is buried; next, the primary limbs; finally the smaller branches. With only the top above the sand and the base buried below, what was once a tree becomes a wide expansive shrub."

In some cases the original roots appear to be still functioning. In many other instances, however, enormously long adventitious roots are put forth from the stems higher up, to replace the dead ones lost in the depths of the sand. In this way new shoot and root systems are literally stacked one upon the other.

"Magnolia, scrub live-oak and sawpalmetto keep their tops above invading sand by stem elongation and production of roots therefrom," Prof. Kurz continues. "Stems laid bare by winds reveal that magnolia stacks new plants upon its old frame; that both magnolia and live-oak may multiply into new individuals by the separation of formerly connected stems in the sand below. On old stable dunes where the soil is rich and moist and the atmospheric conditions mild, magnolias may develop from seed and, barring catastrophe by man or fire, develop into normal trees and magnolia forests."

When dunes sweep into a growth of slash pine, the end result looks the same. Pine "bushes" projecting from the sand are really the uncovered tops of trees buried below. However, in this case no new roots are formed higher up on the trunks; the old roots, though buried deep, are not discouraged and keep on functioning.

Science News Letter, June 7, 1941

A *manuscript* in the Library of Congress, if authentic, is evidence that five of Columbus' ships reached South America in 1494—four years earlier than that mainland is generally supposed to have been found by Spaniards.

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ENGINEERING

MACHINE TRADES BLUEPRINT READING—Russel W. Ihne and Walter E. Streeter—*Amer. Tech. Soc.*, 138 p. mimeographed, blueprints, $2. Fundamental in the knowledge required by the men who are arming America in making airplanes, tanks, machine tools, and all the other essentials is the ability to translate the ideas of the designer into metal shapes, information passed on to them by the use of blueprints. This very practical manual should go far to teach the way it is done. Actual prints, from the simplest to others much more complex are included, and question forms are given to test the student's knowledge. The book should be equally useful in a trade school, and to the worker who is teaching himself.

Science News Letter, June 7, 1941

ARCHITECTURE

SPACE, TIME AND ARCHITECTURE, The Growth of a New Tradition—S. Giedion—*Harvard University Press*, 601 p., illus., $5. A fascinating and copiously illustrated account of the growth of a new tradition in architecture. The author states: "The problem which fascinated me was how our epoch was formed, where the roots of present-day thought lay buried. . . . The historian, the historian of architecture especially, must be in close contact with contemporary conceptions. . . . History is not simply the repository of unchanging facts, but a process, a pattern of living and changing attitudes and interpretations. As such, it is deeply a part of our natures."

Science News Letter, June 7, 1941

ECONOMICS

THE BOULDER CANYON PROJECT, Historical and Economic Aspects—Paul L. Kleinsorge—*Stanford Univ. Press*, 330 p., $3.50. We are used to seeing the Boulder Canyon project as a gigantic, spectacular adventure in engineering. Here is the story of the less spectacular, but fundamental, things that had to be there before the engineers went to work.

Science News Letter, June 7, 1941

LANGUAGE

LANGUAGE IN ACTION, A Guide to Accurate Thinking, Reading and Writing—S. I. Hayakawa—*Harcourt, Brace*, 243 p., $1.25. How to free one's speech and understanding of language from pitfalls and barriers is the theme of this book. Building an emotional picture around a single word, workingman, for instance, or capitalist, "in the course of a lifetime we may pile up entire systems of meaningless noises." Urging objectivity, the author offers such rules as: "Words never say all about anything."

Science News Letter, June 7, 1941

ORNITHOLOGY

BIRD ISLANDS DOWN EAST—Helen Gere Cruickshank; photographs by Allen D. Cruickshank—*Macmillan*, 123 p., $2.50. An interestingly written, excellently illustrated book about sea birds along the coast of Maine, and the author's experiences with them.

Science News Letter, June 7, 1941

OCEANOGRAPHY—MARINE BIOLOGY

PROCEEDINGS OF THE SIXTH PACIFIC SCIENCE CONGRESS OF THE PACIFIC SCIENCE ASSOCIATION held at the University of California, Berkeley, Stanford University, and San Francisco, July 24th to August 12th, 1939, Vol. III—*Univ. of Calif. Press*, 754 p., $3.50.

Science News Letter, June 7, 1941

ZOOLOGY

STUDIES OF NEOTROPICAL COLUBRINAE, VIII. A Revision of the Genus *Dryadophis* Stuart, 1939—L. C. Stuart—*Univ. of Mich. Press*, 106 p., 4 pl., $1.15.

Science News Letter, June 7, 1941

BOTANY

STUDIES OF THE VEGETATION OF MISSOURI—II, Phanerogamic Flora of the Fresh-water Springs in the Ozarks of Missouri—Julian A. Steyermark—*Field Museum of Natural History*, 139 p., 24 plates, $1.25.

Science News Letter, June 7, 1941

GENERAL SCIENCE

EXPLORATIONS AND FIELD-WORK OF THE SMITHSONIAN INSTITUTION IN 1940—*Smithsonian Inst.*, 100 p., illus., *Free upon direct application to Smithsonian Inst., Washington, D. C.*

Science News Letter, June 7, 1941

AERONAUTICS

AMERICAN AVIATION DIRECTORY: Aviation Officials and Companies, Vol. 2, No. 1 (First Half 1941)—Wayne W. Parrish, ed.—*American Aviation Associates*, 361 p., $5 per yr. (2 editions); $3 single copy. See SCIENCE NEWS LETTER, Sept. 7, 1940. Up to date information for all those concerned in any way with aviation.

Science News Letter, June 7, 1941

RADIO

CALLING CQ, Adventures of Short-Wave Radio Operators—Clinton B. DeSoto—*Doubleday, Doran*, 291 p., $2. This is the story of amateur radio, and the "hams" who have formed an unofficial network of communications all over the world, a network potentially of great importance, and which has already many great achievements to its credit. (No index!)

Science News Letter, June 7, 1941

TECHNOLOGY

FARES, PLEASE! From Horse-cars to Streamliners—John Anderson Miller—*Appleton-Century*, 204 p., illus., $3.50. With people in the United States taking 13 billion rides a year, an average of 265 a year for every man, woman and child, the importance of urban transportation is easily apparent. This book relates the story from New York's first stage coach in 1827 to the most modern types of bus.

Science News Letter, June 7, 1941

PHYSIOLOGY

ANNUAL REVIEW OF PHYSIOLOGY, Vol. III, 1941—James Murray Luck and Victor E. Hall, eds.—*Annual Reviews, Inc.* 784 p., $5.

Science News Letter, June 7, 1941

TECHNOLOGY

PATENT FUNDAMENTALS—Leon H. Amdur—*Chemical Pub. Co.*, 305 p., illus., $4. Written by a former patent examiner, and now a patent attorney, this interesting book tells the general reader what things are patentable, how patents are granted, the rights they confer, etc.

Science News Letter, June 7, 1941

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Science News Letter, June 7, 1941

GENERAL SCIENCE

PAPERS OF THE MICHIGAN ACADEMY OF SCIENCE ARTS AND LETTERS, Vol. XXVI (1940); Part I, Botany and Forestry, $1.75; Part II, Zoology, $1.75; Part III, Geography and Geology, $1.50—Eugene S. McCartney and Mischa Titiev, eds.—*Univ. of Mich. Press*, 448 p., illus., plates. Part IV, a General Section, will complete the volume.

Science News Letter, June 7, 1941